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Circular No. 10—Radio. (Fourth Edition—Revised)

U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

C. F. MARVIN, Chief

Forecast Division — *Washington, May 1, 1929*

DISTRIBUTION OF WEATHER INFORMATION, FORECASTS, AND WARNINGS BY NAVAL RADIO FOR THE BENEFIT OF MARINE INTERESTS ON THE PACIFIC OCEAN AND COAST

(In cooperation with Office of Communications, Navy Department)

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The Weather Bureau issues daily (Sundays and holidays included) bulletins containing weather reports, forecasts, and warnings for the benefit of marine interests in the eastern waters of the Pacific and in the States bordering on that ocean. These bulletins are broadcast from Naval Radio stations, and beginning May 1, 1929, will conform to the provisions of this circular.

All time referred to herein is 120th meridian (Pacific standard time) and its equivalent in GCT, unless otherwise specifically indicated.

MAJOR MARINE BULLETIN

This bulletin is broadcast from the San Francisco Naval Radio Station (call letters NPG) twice daily, as follows:

Morning bulletin at 7:30 a. m. (1530 GCT) on wave lengths of 7,000 meters (42.8 k. c.), 2,776 meters (108 k. c.), and 34.9 meters (8,590 k. c.) simultaneously.

Evening bulletin at 7:30 p. m. (0330 GCT) on wave lengths of 7,000 meters (42.8 k. c.), 2,776 meters (108 k. c.), and 34.9 meters (8,590 k. c.), simultaneously.

The bulletin is divided into two parts and invariably begins with the letters USWB (U. S. Weather Bureau).

The first part consists of surface weather conditions at a selected list of places, being based upon observations taken at 5 a. m. and 5 p. m., except as indicated.

The foregoing list is followed by reports from ships in the North Pacific Ocean. Ship observations taken at 4 a. m. are included in the a. m. bulletin, and 4 p. m. observations in the p. m. bulletin. Belated a. m. reports will be added to the following p. m. bulletin, and belated p. m. reports will be added to the next a. m. bulletin. Such belated reports will always be preceded by the words "Previous reports".

The second part of the bulletin consists of a summary of general atmospheric pressure distribution over land and sea, including the locations of "high" and of "low" areas, and the barometer readings at their centers, wind and weather forecasts for Pacific offshore areas, and storm warnings for these areas.

The following is a list of places for which weather observations are included in the regular broadcasts. Only the key letters, and not the names of the places, are transmitted.

Key letters, stations, and locations

Key letters	Name of station	Latitude north		Longitude west	
		°	′	°	′
NM	†Nome, Alaska	64	30	165	24
SPI	‡St. Paul, Alaska	57	15	170	10
DH	‡Dutch Harbor, Alaska	53	55	166	30
TN	†Tanana, Alaska	65	10	152	06
EA	†Eagle, Alaska	64	46	141	12
KD	‡Kodiak, Alaska	57	47	152	22
CV	†Cordova, Alaska	60	32	145	42
JU	‡Juneau, Alaska	58	18	134	24
PR	Prince Rupert, B. C.	54	18	130	18
KA	Kamloops, B. C.	50	41	120	29
TAT	Tatoosh Island, Wash	48	23	124	44
SE	Seattle, Wash	47	38	122	20

Key letters, stations, and locations—Continued

Key letters	Name of station	Latitude north		Longitude west	
		°	′	°	′
NH	North Head, Wash	46	16	124	04
PD	Portland, Oreg	45	32	122	41
RO	Roseburg, Oreg	43	13	123	20
EUR	Eureka, Calif	40	48	124	11
RB	Red Bluff, Calif	40	10	122	15
SM	Sacramento, Calif	38	35	121	30
SF	San Francisco, Calif	37	48	122	26
FN	Fresno, Calif	36	43	119	49
PAR	Point Arguello, Calif	34	35	120	39
LA	Los Angeles, Calif	34	03	118	15
SPE	San Pedro, Calif	33	44	118	16
DI	San Diego, Calif	32	43	117	10
SPO	Spokane, Wash	47	40	117	25
WW	Walla Walla, Wash	46	02	118	20
BA	Baker, Oreg	44	46	117	50
BS	Boise, Idaho	43	37	116	13
HL	Helena, Mont	46	34	112	04
LD	Lander, Wyo	42	50	108	45
WM	Winnemucca, Nev	40	58	117	43
R	Reno, Nev	39	32	119	49
SLC	Salt Lake City, Utah	40	46	111	54
MD	Modena, Utah	37	48	113	54
DV	Denver, Colo	39	45	105	00
GJ	Grand Junction, Colo	39	04	108	34
SA	Santa Fe, N. Mex	35	41	105	57
PH	Phoenix, Ariz	33	28	112	00
YU	Yuma, Ariz	32	45	114	36
HO	§Honolulu, T. H	21	19	157	52
MDI	‖Midway Island	28	12	177	22
ED	Edmonton, Alberta	53	33	113	30
CY	Calgary, Alberta	51	02	114	02
SC	Swift Current, Sask	50	19	108	02
				East	
FMA	*Manila, P. I	14	35	120	59
FGM	*Guam	13	27	144	45
FHO	*Hongkong, China	22	18	114	10
FSH	*Shanghai, China	31	15	121	29
FBI	*Bonin Island	27	05	142	11
FKO	*Koshun, Formosa	40	40	129	11
FNA	*Naha, Japan	26	13	127	41
FKA	*Kagoshima, Japan	31	34	130	33
FTO	*Tokio, Japan	35	41	139	45
FNE	*Nemuro, Japan	43	20	145	35

* Observations taken at 6 a. m., 120th *east* meridian time of the same day.
‡ Observations taken at 4 a. m. and 4 p. m., 120th meridian time.
† Observations taken at 8 a. m. and 8 p. m., 135th meridian time.
§ Observations taken at 8 a. m. and 8 p. m., Honolulu local time.
‖ Observations taken at 6:30 p. m., Midway local time of preceding day.

EXPLANATION OF CODE USED IN THE FIRST PART OF MAJOR MARINE BULLETIN

KEY TO GROUPS AND EXAMPLES

First group.

Barometric pressure (first three figures of group): Pressure, (reduced to sea level) in inches and hundredths, except that the first figure of full reading is omitted. Thus, if the corrected pressure is 29.98 inches, the figures 998 are sent, or if the reading is 30.14 inches, the figures 014 are sent.

Direction of surface wind (fourth figure of group).

0=calm, or no movement.
1=northeast.
2=east.
3=southeast.
4=south.
5=southwest.
6=west.
7=northwest.
8=north.

Force of wind (fifth figure of group): Sent according to Beaufort scale, values 0 to 9, inclusive.

Beaufort scale

Scale No.	Explanatory titles	Miles per hour (statute)	Terms used in forecasts
0.....	Calm	Less than 1	
1.....	Light air	1 to 3	Light.
2.....	Slight breeze.....	4 to 7	
3.....	Gentle breeze	8 to 12	Gentle.
4.....	Moderate breeze.....	13 to 18	Moderate.
5.....	Fresh breeze	19 to 24	Fresh.
6.....	Strong breeze	25 to 31	Strong.
7.....	High wind	32 to 38	
8.....	Gale	39 to 46	Gales.
9.....	Strong gale.....	47 to 54	
*10 (W)	Whole gale	55 to 63	Whole gale.
*11 (S).	Storm	64 to 75	
*12 (H).	Hurricane	Over 75	Hurricane.

*The numeral code does not admit of force in excess of 9 being sent. Therefore, the letters W, S, and H will be used for wind forces 10, 11, and 12, respectively.

NOTE.—The last column gives the terms applicable to the Beaufort scale which are used in the forecasts and warnings issued by the U. S. Weather Bureau.

Example of first group as sent: 99842.

Translation: Barometric pressure, 29.98 inches; wind from south; wind force, 2 (4 to 7 statute miles per hour).

Second group.

Present weather (first figure of group): State of weather at surface at 5 a. m. and 5 p. m.

1=clear (3 tenths or less).
2=partly cloudy (4 to 7 tenths).
3=cloudy (8 to 10 tenths).
4=raining.
5=snowing.
6=thunderstorm.
7=sleeting or hailing.
8=dense fog.

Pressure change (second figure of group) in hundredths of inch during two hours preceding observation.

0=change of less than .04 inch.
1=increase of .04.
2=decrease of .04.
3=increase of .06.
4=decrease of .06.
5=increase of .08.
6=decrease of .08.
7=increase of .10.
8=decrease of .10.
†9=increase or decrease of .12 or more.

†Whether it is an increase or decrease can be obtained by barometric tendency at surrounding stations.

Precipitation (third figure of group): The amount of precipitation during the previous 12 hours is indicated by the third figure of the group. The figure used is indicative of the amount of precipitation, as:

0= no precipitation.
1= .01 inch to .10 inch.
2= .12 inch to .20 inch.
3= .22 inch to .30 inch.
4= .32 inch to .40 inch.
5= .42 inch to .50 inch.
6= .52 inch to .60 inch.
7= .62 inch to .70 inch.
8= .72 inch to .80 inch.
9= .82 inch or more.

Current temperature (fourth and fifth figures of group): Temperatures are reported in even degrees, Fahrenheit. When the temperature is zero or 100°, the fourth and fifth figures will be 00; when between 2° and 8°, inclusive, the fourth figure will be 0 and the fifth figure the temperature; when below zero, complementary figures will be used (subtract coded temperature sent from 100° to obtain correct temperature). The significant figure 1 is omitted for temperatures of 100° or more. No confusion should arise in determining below zero and above 100° temperatures when the season of the year and the location of the reporting stations are considered.

Examples of temperature coded for stations which may be 100° or more in summer and below zero in winter:

(Eagle) EA 62= 62° in summer or −38° in Winter.
(Calgary) CY 00=100° in summer or zero in winter.
(Boise) BS 08=108° in summer or 8° in winter.

Examples of groups as sent and as translated:

52798: Snowing; pressure change, decrease of .04 inch during preceding two hours; precipitation .62 to .70 inch; current temperature, −2°. (If in winter.)

21374: Partly cloudy weather; pressure change, increase of .04 inch during preceding two hours; .22 to .30 inch precipitation; current temperature, 74°.

SHIP REPORTS

Ship reports are included in the first part of the bulletin immediately following the land stations. They are included in two groups, preceded by the call letters identifying the ship. The first group consists of five numerals, signifying the ship's position, and the second group of five numerals expressing the barometric pressure, wind direction and force. The key to second group in ship reports is that used for first group in land reports. In the first group giving the ship's position (to the nearest degree), the first two numerals express the latitude (north) and the last three the longitude (west).

Example: WMCH 31140 00646.

Translation: S. S. *Maui*; Latitude 31 degrees north; longitude 140 degrees west. Barometric pressure 30.06 inches; wind from the south; wind force of 5 (19 to 24 miles per hour).

CONTENTS OF THE SECOND PART OF MAJOR MARINE BULLETIN

(*a*) Summary of general atmospheric pressure distribution over land and sea, including the locations of "high" and "low" areas, and the barometer readings at their centers.

(*b*) Wind and weather forecasts* for Pacific offshore areas:
North of Cape Blanco.
Between Cape Blanco and Point Conception.
South of Point Conception.

*Periods covered by the forecasts: In a. m., Major Bulletins, 24 hours, beginning at noon. In p. m., Major Bulletin, 24 hours, beginning at midnight.

NOTE.—Forecasts for the States of Washington, Oregon, Idaho, Nevada, and California, and flying weather forecasts for aviation zones 12, 13, and 14, immediately follow the Major Bulletins using the same frequencies. Details regarding these forecasts will be found in the Weather Bureau Circular No. 17 (Second Edition, revised).

LOCAL BROADCAST SCHEDULES

The table below shows additional Naval Radio stations from which local distributions are made daily (including Sundays and holidays), their call letters, transmitting frequencies and wave lengths, the information broadcast therefrom, the hours of distribution, and the Weather Bureau stations from which the forecasts and information are supplied.

Whenever storm warnings are issued in the forenoon (based on 5 a. m. observations) they are broadcast at the same time as the wind and weather forecasts. When issued in the afternoon (based on special observations) or at night (based on 5 p. m. observations) they are broadcast at the evening hours indicated.

Ships may request any station listed herein to furnish the latest weather forecasts and warnings and weather reports.

Offshore wind and weather forecasts broadcast at or before noon and in the p. m. are for the 24 hours beginning at noon and midnight, respectively; storm warnings are for 24 hours beginning at the hour indicated in the warning messages.

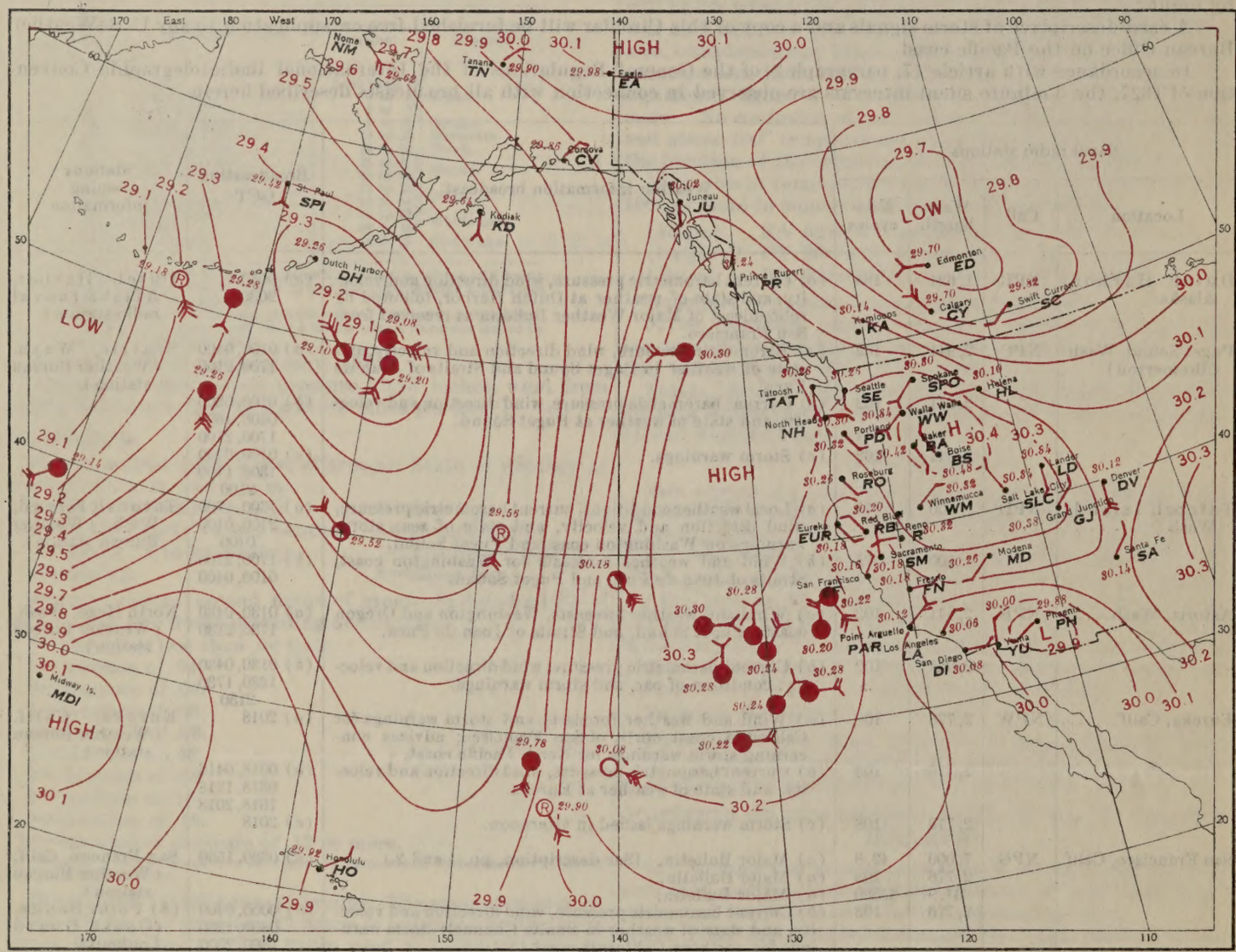
Storm warnings are displayed at 44 points on the Pacific coast of the United States. Flags are used by day and lanterns by night.

A card descriptive of storm signals and a copy of this Circular will be furnished free on application to any U. S. Weather Bureau Office on the Pacific coast.

In accordance with article 17, paragraph 2, of the General Regulations of the International Radiotelegraphic Convention of 1927, the 3-minute silent intervals are observed in connection with all broadcasts described herein.

Naval radio stations				Weather information broadcast	Broadcasting GCT	Stations issuing information
Location	Call	Wave length	Kilocycles			
Dutch Harbor, Alaska.	NPR	1,621	185	(a) Current barometric pressure, wind direction and velocity, and state of weather at Dutch Harbor, followed by rebroadcast of Major Weather Bulletin as received from San Francisco.	(a) 0530 2030	Dutch Harbor, Alaska (naval radio station).
Puget Sound, Wash. (Bremerton)	NPC	2,941	102	(a) Barometric pressure, wind direction and velocity, and state of weather in Puget Sound and Straits of Juan de Fuca.	(a) 0100, 0400 1700, 2100	Seattle, Wash. (Weather Bureau station).
		2,941	102	(b) Current barometric pressure, wind direction and velocity, and state of weather at Puget Sound.	(b) 0100, 0300 0400, 1300 1700, 2100	
		2,941	102	(c) Storm warnings.	(c) 0100, 0400 1300, 1700 2100	
Tatoosh Island, Wash.	NPD	800	375	(a) Local weather conditions, current barometric pressure, wind direction and velocity, and state of sea; storm warnings on Washington coast and Puget Sound.	(a) 1300, 1700 2100, 0100 0400	Tatoosh Island, Wash. (Weather Bureau station).
		800	375	(b) Wind and weather forecasts for Washington coast, Straits of Juan de Fuca and Puget Sound.	(b) 1700, 2100 0100, 0400	
Astoria, Wash.....	NPE	2,941	102	(a) Wind and weather forecasts, Washington and Oregon coasts, Puget Sound, and Straits of Juan de Fuca.	(a) 0130, 0430 1730, 2130	North Head, Wash. (Weather Bureau station).
		2,941	102	(b) Current barometric pressure, wind direction and velocity, condition of bar, and storm warnings.	(b) 0130, 0430 1330, 1730 2130	
Eureka, Calif.....	NPW	2,776	108	(a) Wind and weather forecasts and storm warnings for California coast north of San Francisco; advices concerning storm warnings for North Pacific coast.	(a) 2018	Eureka, Calif. (Weather Bureau station).
		2,776	108	(b) Current barometric pressure, wind direction and velocity, and state of weather at Eureka.	(b) 0018, 0418 0818, 1218 1618, 2018	
		2,776	108	(c) Storm warnings issued in afternoon.	(c) 2018	
San Francisco, Calif.	NPG	7,000	42.8	(a) Major Bulletin. (See description, pp. 1 and 2.)	(a) 0330, 1530	San Franciso, Calif. (Weather Bureau station).
		2,776	108	(a) Major Bulletin.		
		34.9	8,590	(a) Major Bulletin.		
		2,776	108	(b) Current barometric pressure, wind direction and velocity, and state of weather in Bonita Channel; storm warnings for northern California coast.	(b) 0000, 0400 0800, 1200 1600, 2000	(b) Point Bonita, (Coast Guard Lookout).
		34.9	8,590	(c) Aviation Bulletin. (See Circular No. 17.)	(c) 0218, 1418	(c)(Weather Bureau station).
		2,776	108	(c) Aviation Bulletin. (See Circular No. 17.)		
		7,000	42.8	(c) Aviation Bulletin. (See Circular No. 17.)		
San Diego, Calif....	NPL	2,941	102	(a) Southern California forecast and local weather conditions (barometric pressure, temperature, weather, force and direction of wind).	(a) 1630	San Diego, Calif. (Weather Bureau station).
		2,941	102	(b) Local weather conditions.	(b) 2200	
		2,941	102	(c) Storm warnings and advisory warnings.	(c) On receipt and at 0500	
Honolulu, T. H..... (Heeia)	NPM	5,552	54	(a) Forecasts of wind and weather for Hawaiian Islands and neighboring ocean areas.	(a) 2230	Honolulu, T. H. (Weather Bureau station).
		5,552	54	(b) Current barometric pressure, wind direction and velocity, and state of weather at Honolulu. NOTE.—No broadcasts from Honolulu on Sundays and holidays.	(b) 0630, 1830 2230	
Cavite, P. I.....	NPO	5,354	56	Weather information.	0430 1400	Phillipine Weather Service (Manila).
		2,776	108	Weather information.	0430 1400	
		37.34	8,034	Weather information.	1400	
		18.67	16,068	Weather information.	0430	
Tutuila, Samoa Is...	NPU	2,828	106	Weather information.	2300	Samoan Weather Service (Tutuila).

CHART SHOWING HOW WEATHER REPORTS BROADCAST IN MAJOR BULLETINS MAY BE ENTERED AND USED IN THE PREPARATION OF WEATHER MAPS AT SEA



This map shows conditions that obtained in the a. m. of January 8, 1929, and is made up of data distributed by radio. Three elements are shown (in red) for each station and ship: Barometric pressure in inches, indicated by figures; wind direction, shown by arrow which flies with the wind; and wind force (Beaufort scale), indicated by the number of feathers on the arrow, and the character of the weather is indicated for ships. The red lines are isobars that pass through points having equal barometric pressure, and were drawn from inspection after the pressure values were entered. The centers of areas of low pressure are indicated by the word LOW and centers of high pressure by the word HIGH. Symbols indicate state of weather: ○ clear; ◑ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓕ fog; Ⓜ report missing.

In the Northern Hemisphere winds blow spirally inward, counter-clockwise, toward and around the center of a LOW, while from the center of a HIGH they blow spirally outward in a direction similar to that described by the hands of a clock. The steeper the pressure gradient (that is, the closer the isobars are together) the higher are the wind velocities.

Copies of this base chart (size, $8\frac{3}{4}$ by $11\frac{1}{2}$ inches) will be supplied free to vessel masters who regularly take and forward weather observations to the U. S. Weather Bureau, or to the Hydrographic Office, U. S. Navy.